X-RAY TUBE WITH MAGNETIC ELECTRON STEERING

TECHNOLOGY READINESS LEVEL: 5

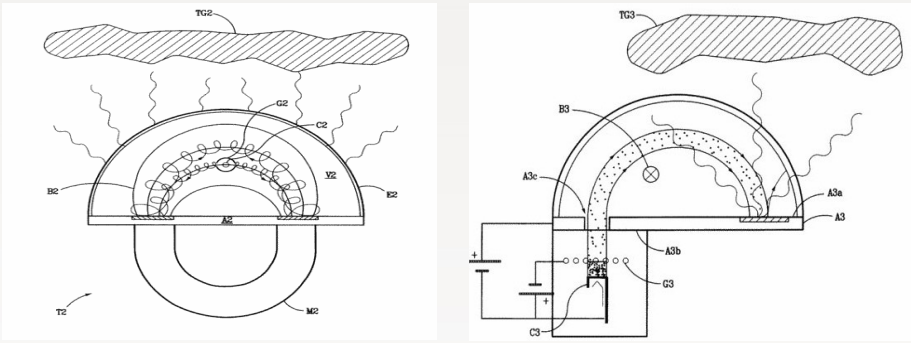
KEY ELEMENTS HAVE BEEN DEMONSTRATED IN RELEVANT ENVIRONMENTS.

US PATENT # 6,151,384

TECHNOLOGY SUMMARY

Sandia National Laboratories has created an improved efficiency compact X-ray source to address a wide range of applications. The high average power large area X-ray tube provides increased X-ray generation efficiency through the use of magnetic steering to reduce the number of electrons that do not contribute to X-ray production.

This invention consists of a cathode and anode mounted within an evacuated envelope. A magnetic field generator imposes a magnetic field that urges electrons toward the anode. This reduces the number of electrons that would escape the anode and cause electron heating of the tube. The magnetic field also urges electrons toward areas of the anode that will produce X-rays that are not shadowed. This improves the useable X-ray pattern.



These drawings depict a schematic view of an x-ray tube according to the present invention.

POTENTIAL APPLICATIONS

- Agriculture
- Food Sterilization
- Destruction of Pathogenic Microorganisms
- Testing and Inspection of industrial tools and systems
- Water Purification
- Medical

TECHNOLOGICAL BENEFITS

- Increases the proportion of electrons emitted from the cathode that contribute to X-ray production in a compact geometry
- Provides increased X-ray generation efficiency by increasing the number of electrons that reflect back on the anode

TECHNOLOGY INQUIRY?

For more information or licensing opportunities contact us at

ip@sandia.gov

Refer to SD # 6081

or visit

https://ip.sandia.gov

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